510(k) Summary of Safety and Effectiveness for the ADVIA® 1650 Chemistry Albumin BCP Assay (ALBP)

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

1. **510(k) Number:** k132664

2. **Applicant:**

Contact: Kira Gordon, PhD
Sr. Regulatory Affairs Specialist
Address: Siemens Healthcare Diagnostics, Inc
511 Benedict Ave,
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Phone: (914) 524-2996
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OCT 16 2013

3. **Date:** August 26, 2013

4. **Proprietary and Established Names:**

ADVIA Chemistry Albumin BCP Assay (ALBP)
ADVIA Chemistry Albumin BCP Calibrator

5. **Regulatory Information:**

Reagent
Regulation section: 21 CFR §862.1035, bromcresol purple dye-binding, albumin
Classification: Class II
Product Code: CJW
Panel: Clinical Chemistry (75)

Calibrator
Regulation section: 21 CFR §862.1150, calibrator, multi-analyte mixture
Classification: Class II
Product Code: JIX
Panel: Clinical Chemistry (75)

6. **Predicate Device:**

Reagent
Device Name: Dimension Clinical Chemistry System Albumin Flex reagent cartridge
Common Name: Dimension Clinical Chemistry System Albumin Assay
510(k) Number: k861700
Manufacturer: Siemens Healthcare Diagnostics, Inc.

Calibrator
Device Name: Dimension Clinical Chemistry System TP/ALB Calibrator
Common Name: Dimension Clinical Chemistry System TP/ALB Calibrator
510(k) Number: k861700
Manufacturer: Siemens Healthcare Diagnostics, Inc.

7. Intended Use:

See Indications for Use

8. Indications for Use:

For *in vitro* diagnostic use in the quantitative measurement of albumin in human serum or plasma on ADVIA Chemistry systems. Albumin measurements are used in the diagnosis and treatment of numerous diseases primarily involving the liver or kidneys.

For *in vitro* diagnostic use in the calibration of the ADVIA Chemistry Albumin BCP Assay (ALBP) on ADVIA Chemistry systems.

9. Device Description:

The Albumin BCP reagents are ready-to-use liquid reagents packaged for use on the automated ADVIA 1650 Chemistry systems. Reagents are supplied in two configurations: fill volume of 18 mL in a 20 mL wedge or 35 mL in a 40 mL wedge, 4 wedges/kit.

The calibrator is a multi-analyte human serum based product containing albumin derived from human serum. The kit consists of 3 vials of one-level calibrator which are lyophilized. The target concentration of this calibrator is 4.3 g/dL. The volume per vial (after reconstitution with deionized water) is 2.0 mL.

10. Test Principle:

The ADVIA Chemistry Albumin BCP Assay is an adaptation of the bromocresol purple (BCP) dye-binding method reported by Carter and Louderback, et al. In the ADVIA Chemistry ALBP Assay, serum or plasma albumin quantitatively binds to BCP to form an albumin-BCP complex that is measured as an endpoint reaction at 596/694 nm.

11. Substantial Equivalence Information:

Predicate device name:	Dimension Clinical Chemistry System Albumin Flex® reagent cartridge (ALB) Dimension Clinical Chemistry System TP/ALB Calibrator 2
Predicate K number:	k861700

Comparison with Predicate:

Reagent:

Item	**New Device:** **ADVIA Chemistry Albumin BCP Assay (ALPB)**	**Predicate Device: Siemens Dimension Clinical Chemistry System Albumin Flex® reagent cartridge (ALB)**
Analyte	Albumin	Same
Intended Use/ Indications for Use	For *in vitro* diagnostic use in the quantitative measurement of albumin in human serum or plasma on ADVIA Chemistry systems. Albumin measurements are used in the diagnosis and treatment of numerous diseases primarily involving the liver or kidneys.	For *in vitro* diagnostic use in the quantitative measurement of albumin in human serum or plasma.
Instrument to be used	ADVIA 1650 Chemistry System	Dimension Clinical Chemistry System
Measurement	quantitative	Same
Sample type	Serum, Plasma	Same
Reference interval	3.4 – 5.0 g/dL	Same
Format	Liquid	Same
Use of Calibrators	Yes	Same
Analytical measuring interval	0.6 – 8.0 g/dL	Same
Method Principle	bromocresol purple (BCP) dye-binding method	Same
Reagents	Single reagent	Same
Standardization	ERM-DA470k Reference Material	Same

Calibrator

Item	**New Device:** **ADVIA Chemistry Albumin BCP Calibrator**	**Predicate Device: Siemens Dimension Clinical Chemistry System TP/ALB calibrator**
Intended Use	For *in vitro* diagnostic use in the calibration of the ADVIA Chemistry Albumin BCP Assay (ALBP) on ADVIA Chemistry systems.	for *in vitro* diagnostic use in the calibration of Albumin BCP Assay
Instrument	ADVIA 1650 Chemistry System	Dimension Clinical Chemistry System
Measured Analytes (value assigned)	Albumin	Albumin, Total Protein

Form	Lyophilized	Same
Matrix	Human serum	Same
Analyte source	Human source	Same
Number of levels	One	Three
Fill Volume	Reconstitute with 2 mL DI water	Same

12. Standard/Guidance Document Reference

- Interference Testing in Clinical Chemistry; Approved Guideline - Second Edition (CLSI EP7-A2)
- Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline – Second Edition (CLSI EP17-A2)
- Evaluation of Precision Performance of Quantitative Measurement Methods; Approved Guideline-Second Edition (CLSI EP5-A2)

13. Performance Characteristics

The following data represent typical performance for the ADVIA Chemistry Albumin BCP Assay and were collected on ADVIA 1650 Chemistry system. Substantial equivalence was demonstrated by testing several performance characteristics including precision, method comparison, interfering substances and analytical range. All of the evaluation studies gave acceptable results when compared to the predicate device. These studies support that the ADVIA Chemistry Albumin BCP Assay is substantially equivalent to the predicate device.

1. Precision

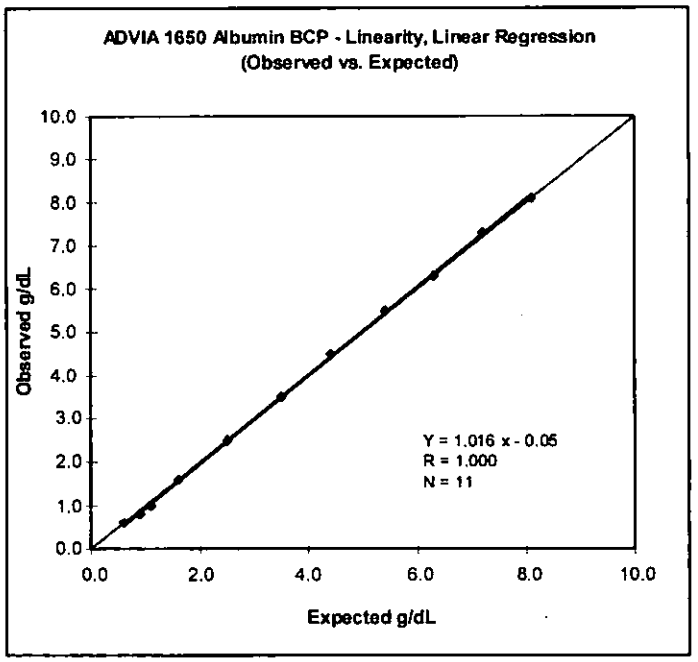
Within run and Total Precision were established by Assaying serum sample pools and serum based controls. Each sample was Assayed 2 replicates per run, 2 runs per day, for at least 20 days. Precision estimates were computed according to CLSI document EP5-A2, *Evaluation of Precision Performance of Quantitative Measurement Methods*; Approved Guideline.

		MEAN	Within Run		Between Run		Between Day		Total	
Product	**N**	**g/dL**	**SD**	**CV**	**SD**	**CV**	**SD**	**CV**	**SD**	**CV**
Serum Control	80	2.7	0.03	0.9	0.00	0.0	0.03	1.2	0.04	1.5
Serum Control	80	4.0	0.03	0.7	0.01	0.3	0.03	0.6	0.04	1.0
Serum Pool	80	3.5	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Serum Pool	80	5.2	0.04	0.7	0.02	0.3	0.02	0.4	0.05	0.9

2. Linearity/Assay reportable range

Linearity of the Assay on ADVIA 1650 Chemistry system was assessed by evaluating eleven dilutions across the measuring range.. All samples were tested on the ADVIA 1650 Chemistry analyzer. Observed values were compared vs. expected values using linear regression analysis. The low end of the assay range is calculated based on the Limit of Quantitation. The high end of the assay range is based on the linearity calculations.

The linear/measuring range of the assay is 0.6 to 8.0 g/dL.



3. Limit of Blank, Limit of Detection, Limit of Quantitation

The estimations of the Limit of Blank (LoB), Limit of Detection (LoD) and Limit of Quantitation (LoQ) were performed according to CLSI document EP17-A2, *Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures*, Approved Guideline. The LoB for the ADVIA Chemistry Albumin BCP Assay on the ADVIA 1650 Chemistry system is 0.1 g/dL. Limit of detection (LoD) is the smallest amount that this Assay can reliably detect to determine presence or absence of an analyte. The LoD for for the ADVIA Chemistry Albumin BCP Assay on the ADVIA 1650 Chemistry system is 0.6 g/dL. LoB and LoD values are determined with proportions of false positives (α) less than 5% and false negatives (ß) less than 5%, based on 720 determinations with 240 blank and 480 low-level sample replicates. . Limit of Quantitation (LoQ) is 0.6 g/dL based on an inter-assay precision of <10% CV.

4. Method comparison with predicate device

The performance of the ADVIA Chemistry Albumin BCP Assay (y) for serum samples on ADVIA 1650 Chemistry system was compared with the performance of the predicate device (x). Sixty-nine serum samples with albumin concentrations throughout the range of the assay were tested. The results calculated using least squares linear regression (1st replicate) are as follows:

ADVIA Chemistry Albumin BCP = 0.99 (predicate device) + 0.01 g/dL
Slope 95%CI: 0.98 – 1.00

Intercept 95% CI: -0.03 – 0.05
Sample range: 0.9 – 7.9 g/dL
r=0.999

5. Matrix comparison
The performance of the ADVIA Chemistry Albumin BCP Assay (y) was compared on ADVIA 1650 Chemistry system for plasma samples (Lithium Heparin and Potassium EDTA) vs. serum samples (x). Forty seven paired plasma/serum samples with albumin concentrations throughout the range of the assay were tested. The results calculated using linear regression (1st replicate) are as follows:

ADVIA Chemistry Albumin BCP Plasma (Lithium Heparin) = 1.01 (ADVIA Chemistry Albumin BCP Serum) + 0.04 g/dL Slope 95%CI: 0.99 – 1.03
Intercept 95% CI: -0.05 – 0.12
Sample range: 1.0 – 7.8 g/dL
r=0.998

ADVIA Chemistry Albumin BCP Plasma (Potassium EDTA) = 0.99 (ADVIA Chemistry Albumin BCP Serum) - 0.06 g/dL
Slope 95%CI: 0.96 – 1.03
Intercept 95% CI: -0.23 – 0.07
Sample range: 1.0 – 7.7 g/dL
r=0.993

6. Analytical specificity
Interferences from icterus, lipemia, and hemolysis, factor were evaluated using a significance criterion of >10% bias. Bias is the difference in the results between the control sample (without the interferent) and the test sample (contains the interferent) expressed in percent. Bias exceeding 10% is considered interference.
Bilirubin (conjugated and unconjugated) tested up to 60 mg/dL, lipemia up to 525 mg/dL and hemoglobin up to 750 g/dL were shown not to cause significant interference with this assay.

7. Reference Interval (Expected Values)
Expected values are within 3.4 – 5.0 g/L **
**Willey DA, Savory J, Lasky F. An Evaluation of a Revised Albumin Method for the aca® discrete clinical analyzer, Du Pont Company, Wilmington, DE, August 1982
Siemens provides this information for reference. As with all *in vitro* diagnostic Assays each laboratory should determine its own reference ranges for the diagnostic evaluation of patient results.

8. Reagent and Calibrator Stability:
Reagent: for opened products, once placed on the system reagents are stable for 60 days. The shelf life of the ADVIA Chemistry Albumin BCP Reagent is 12 months at 2-8°C. For unopened product, see the expiration date on the reagent carton.

Calibrator: for opened products, once the cap is removed, assigned values are stable for 8 hours when recapped immediately after use and stored at 2-8°C. The shelf life of the ADVIA Chemistry Albumin BCP Calibrator is 18 months at 2-8°C. For unopened product, see the expiration date on the calibrator carton.

The calibrator which is used for the ADVIA Chemistry Albumin BCP assay is the same calibrator (one level only) which was previously cleared as Siemens Dimension Clinical Chemistry System TP/ALB calibrator under k861700 and is relabeled for ADVIA Chemistry use

9. Traceability

The ADVIA Chemistry Albumin BCP Assay is traceable to ERM-DA470k Reference Material. Assigned values of the ADVIA Chemistry Albumin BCP Calibrator are traceable to this standardization

10. Value Assignment

The value assignment protocol for the ADVIA Chemistry Albumin BCP calibrator is the same as for the predicate device which was cleared under k861700.

Target, g/dL	4.3
Target Range, g/dL	4.1 to 4.5

14. Conclusions

The ADVIA Chemistry Albumin BCP Assay with associated calibrator on ADVIA 1650 Chemistry system is substantially equivalent in principle and performance to the Siemens Healthcare Diagnostics Dimension Albumin Assay reagent and Dimension TP/ALB calibrator respectively, cleared under k861700.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

October 16, 2013

Siemens Healthcare Diagnostics, Inc.
C/O Kira Gordon, Ph.D.
511 Benedict Ave.
TARRYTOWN NY 10591

Re: K132664
Trade/Device Name: ADVIA Chemistry Albumin BCP Assay (ALBP)
ADVIA Chemistry Albumin BCP Calibrator
Regulation Number: 21 CFR 862.1035
Regulation Name: Albumin test system
Regulatory Class: II
Product Code: CJW, JIX
Dated: August 26, 2013
Received: August 27, 2013

Dear Dr. Gordon:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Carol C. Benson -S for

Courtney H. Lias, Ph.D.
Director
Division of Chemistry and Toxicology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): k132664

Device Name:

ADVIA Chemistry Albumin BCP Assay (ALBP)
ADVIA Chemistry Albumin BCP Calibrator

Indications for Use:

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For in vitro diagnostic use in the calibration of the ADVIA Chemistry Albumin BCP Assay (ALBP) on ADVIA Chemistry Systems.

Prescription Use ___X___ (21 CFR Part 801 Subpart D) And/Or Over the Counter Use ____. (21 CFR Part 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE; CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostics and Radiological Health (OIR)

Yung W. Chan -S

Division Sign-Off
Office of In Vitro Diagnostic Device
Evaluation and Safety

510(k) k132664